	Application No.	Applicant(s)	
Notice of Allowability	09/557,736	LIAO, HENG	
	Examiner	Art Unit	
	Hussein A. El-chanti	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *8/25/2006*.

2. ☒ The allowed claim(s) is/are *1,2,6,7,9-13,15-27,29 and 30*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
        Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO/SB/08),
    Paper No./Mail Date *7/04*

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413),
    Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

EXAMINER'S AMENDMENT

1.   This action is responsive to amendment received on August 25, 2006.

2.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Mr. George Yee on Sep. 21, 2006.

3.   The application has been amended as follows:

1.   (Currently amended): A method for identifying protocol

encapsulation in received network data at a networking device comprising:

providing a language definition including a grammar;

receiving incoming network data; and

processing said incoming network data in accordance with a formal

language processing technique using said language definition, said processing

including:

providing a deterministic finite automaton (DFA) based on a set of

regular expressions;

performing lexical token scanning of said network data to produce

plural lexical tokens including recognizing lexical tokens contained in said data

packets using said DFA, said DFA including a representation of said lexical

tokens;

parsing said network data using said grammar, said network data

being organized into data packets, including parsing said lexical tokens to identify

grammatical structure among said lexical tokens using said DFA to identify

protocol encapsulation in said network data.

2.   (Currently amended): The method of claim 1 wherein said

grammar is a grammar graph represented by said DFA, the method further

including providing a deterministic finite automaton (DFA) representing said

grammar graph.

3-5.   (Canceled)

6.   (Currently amended): In a data packet network switching

device, a method for processing data packets comprising:

providing a language definition including a grammar;

receiving plural data packets, each having a length not necessarily equal

to one another; and

for each data packet, processing said data packet according to a formal

language processing technique using said language definition including:

providing a deterministic finite automaton (DFA) based on a set of

regular expressions,

lexically scanning said data packet to produce plural lexical tokens

including using said DFA to recognize said lexical tokens, said DFA including a

representation of said lexical tokens,

parsing said lexical tokens using said grammar to ~~produce~~ identify

one or more ~~identified~~ protocol encapsulation including identifying grammatical

structure among said lexical tokens using said DFA, and

processing said data packet based on said identified protocols.

7.   (Original): The method of claim 6 further including compiling

said grammar to produce a grammar graph.

8.   (Canceled): ~~The method of claim 7 wherein said lexical~~

~~scanning includes providing regular expressions for identifying said lexical~~

~~tokens.~~

9.   (Currently amended): The method of claim [[8]]6 further

including compiling said regular expressions to produce said DFA ~~are into a~~

~~deterministic finite automaton (DFA)~~.

10.   (Original): The method of claim 9 further including

incorporating said grammar graph into said DFA.

11.   (Currently amended): In a data packet receiving and

forwarding device, a method for processing data packets constituting a data

stream ~~comprising a stream of data~~, said method comprising:

receiving a description of grammar rules in the form of a grammar packet

classification language;

compiling said grammar packet classification language to produce a

grammar graph;

providing a deterministic finite automaton (DFA) based on a set of regular

expressions;

configuring a programmable grammatical packet classifier with said

grammar graph;

processing said data stream in accordance with a formal language

processing technique using said grammar packet classification language including:

performing lexical token scanning of said data stream to produce

plural lexical tokens including recognizing lexical tokens contained in said data

packets using said DFA, said DFA including a representation of said lexical

tokens; and

parsing said data stream with said grammatical packet classifier to

identify a protocol structure in a received data packet, including parsing said

lexical tokens to identify grammatical structure among said lexical tokens using

said DFA to identify protocol encapsulation in said stream of data; and

processing said received data packet in accordance with said protocol

structure.

12.   (Currently amended): The method of claim 11 further including:

receiving a description of classification rules in a lexical classification

language;

compiling said classification language to produce said DFA a deterministic

finite automaton (DFA) comprising plural states; and

configuring said ~~hardware~~ grammatical packet classifier with said DFA[[;

and]]

~~scanning said data stream with said hardware packet classifier to produce~~

~~plural lexical tokens,~~

~~wherein said parsing is a step of parsing said lexical tokens.~~

13.   (Original): The method of claim 12 wherein said grammar graph is

incorporated into said DFA.

14.   (Canceled): ~~The method of claim 12 wherein said lexical~~

~~classification language includes regular expressions.~~

15.   (Currently amended): The method of claim [[14]]12 wherein said

regular expressions include arithmetic and logic operations.

16.   (Original): The method of claim 15 wherein said regular

expressions further include skip operations.

17.   (Original): The method of claim 16 wherein said regular

expressions further include data storage operations.

18.   (Currently amended): A network data packet classifier comprising:

an input port for receiving network data packets comprising a stream of

data;

a memory assemblage configured with data representing a deterministic

finite automaton (DFA), said DFA defined by a language definition and representing a

grammar graph and plural regular expressions; and

decompression logic operatively coupled to said memory assemblage and

configured to process said stream of data according to a formal language processing

technique using said language definition including a step of lexical token scanning to

scan said stream of data with said DFA to find a matching one of said regular

expressions thereby producing plural lexical tokens, said DFA including a

representation of said lexical tokens,

said decompression logic further configured to parse said lexical tokens

with said DFA to identify grammatical structure among said lexical tokens using said

DFA to identify a protocol ~~structure~~ encapsulation in a received network data packet,

wherein processing of said network data packets depends on said

protocol ~~structure~~ encapsulation.

19.   (Original): The classifier of claim 18 wherein some of said regular

expressions include arithmetic instructions and logic instructions, said memory

assemblage further configured to contain said instructions, the classifier further

including an arithmetic logic unit operatively coupled to said decompression logic and

configured to execute said instructions.

20.   (Original): The classifier of claim 19 further including at least one

register operatively coupled to said arithmetic logic unit, said arithmetic logic unit further

configured to store data into said register in response to a save instruction.

21.   ·(Original): The classifier of claim 19 further including skip logic operatively coupled to said logic component and configured to skip over an amount of data in response a skip instruction.

22.   (Original): The classifier of claim 18 wherein said network data packets can vary from one packet to another.

23.   (Original): The classifier of claim 18 wherein said DFA is in compressed form.

24.   (Original): The classifier of claim 23 wherein said DFA comprises plural non-default states and plural default states, and said memory assemblage comprises a base memory, a next-state memory, and a default-state memory; said base memory configured to contain address locations of said next-state memory, said next-state memory representing all of said non-default states, said default-state memory representing all of said default states.

25.   (Original): The classifier of claim 24 wherein said memories are random access memories.

26.   (Original): The classifier of claim 24 wherein said memories are read-only memories.

27.   (Currently amended): A network packet classifier comprising:

means for receiving an incoming network packets; and

means for identifying protocol structure in said network packets including

means for processing said network packets in accordance with a formal language

processing technique using a language definition, including a-step-ofmeans for scanning

said network packets to match patterns in its said network packets constituent data

against plural regular expressions to produce lexical tokens and means for parsing

through said lexical tokens using a grammar, said regular expressions and said

grammar being defined by said language definition,

said means for scanning including a memory component configured with

data to represent a deterministic finite automaton (DFA) based on said regular

expressions, said DFA including a representation of said lexical tokens,

said means for scanning configured to recognize said lexical tokens

contained in said network packet using said DFA,

said means for parsing configured to identify grammatical structure among

said lexical tokens using said DFA to identify protocol encapsulation in said incoming

network packet.

28.   (Canceled): The classifier of claim 27 wherein said means for

scanning includes a memory component configured with data to represent a

deterministic finite automaton (DFA).

29.   (Currently amended): The classifier of claim [[28]]27 wherein said

memory component is further configured to include said grammar.

30.   (Original): The classifier of claim 27 wherein said regular

expressions include arithmetic specifiers and said means for classifying includes an

arithmetic logic unit configured to perform operations in accordance with said arithmetic

specifiers.

Reasons for Allowance

4.   Claims 1, 2, 6, 7, 9-13, 15-27 and 29-30 are allowed.

5.   The following is an examiner's statement of reasons for allowance:

The prior art of record does not teach singly or in combination the claimed

limitation "providing a deterministic finite automaton (DFA) based on a set of regular

expressions; performing lexical token scanning of said network data to produce plural

lexical tokens including recognizing lexical tokens contained in said data packets using

said DFA, said DFA including a representation of said lexical tokens; and parsing said

network data using said grammar, said network data being organized into data packets,

including parsing said lexical tokens to identify grammatical structure among said lexical

tokens using said DFA to identify protocol encapsulation in said network data" as in

claims 1, 2, 6, 7, 9-13, 15-27 and 29-30.

6.   Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hussein A. El-chanti whose telephone number is (571)272-3999. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571)272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hussein El-chanti

Sep. 27, 2006

ABDULLAH SALAD
PRIMARY EXAMINER